

The article explores the use of deep supervised learning, specifically a U-Net Convolutional Neural Network, combined with MODIS-Aqua chlorophyll and reflectance data to monitor coastal-offshore water interactions in the Levantine Sea. The study identifies and tracks pinching-off events, where coastal currents form separate water masses, revealing significant variations in these events along the Lebanese coast compared to the more stable flow along the Egyptian coast. Seasonal patterns were observed, with higher activity in summer and fall and lower activity in spring. The study highlights the limitations of traditional altimetry methods in capturing near-coast dynamics and underscores the need for increased in-situ observations and more precise altimetric data. However, I think there are some key problems with this article in terms of modeling, and here are the revisions:

1. Building on the introduction, a brief reference is made to how advances in artificial intelligence and machine learning have revolutionized oceanographic research. This can provide a broader context for the use of deep learning in this study.
2. Measures taken to prevent model overfitting should be discussed in the article to demonstrate model generalizability.
3. Provide more detailed quantitative results on the model's performance, such as precision, recall, and F1 scores, to give a clearer picture of its effectiveness in detecting pinching-off events.
4. Describe the DBSCAN clustering algorithm in detail, discussing the limitations and assumptions of the DBSCAN clustering algorithm and how these limitations and assumptions affect the results. Mention other clustering methods considered and the reasons for choosing DBSCAN.
5. In terms of model selection, I think that U-net alone is not the optimal approach, and improvements to the U-net model should be considered and compared with other semantic segmentation methods, such as Swin-Transformer
6. Add a comparison of the U-Net model's performance with other existing methods for detecting coastal-offshore interactions, highlighting the improvements and any remaining challenges.